

CLAIMS

1. A semiconductor package obtained by
collectively fabricating a plurality of semiconductor
packages on a wafer in a batch process and dicing the
5 resulting wafer product into discrete semiconductor
packages, wherein

10 said semiconductor package is a stacked
body formed by bonding two or more semiconductor devices
through an insulating layer;

each of said semiconductor devices
comprises a substrate and a device pattern formed on a
surface thereof; and

15 a device pattern surface of a lower
semiconductor device faces a non-device pattern surface
of a semiconductor device stacked on said lower
semiconductor device.

2. A semiconductor package as defined in claim 1,
wherein said semiconductor device positioned as the
lowermost layer further comprises a heat radiation layer,
20 formed of a material having a high heat transfer rate, on
the non-device pattern surface thereof.

3. A semiconductor package as defined in claim 2,
wherein said heat radiation layer is one deposited on the
non-device pattern surface of a wafer as the lowermost
25 layer, before said semiconductor packages are diced.

4. A semiconductor package as defined in claim 2
or 3, wherein said heat radiation layer is one formed by
a thin film formation technology.

5. A semiconductor package as defined in claim 2
30 or 3, wherein said heat radiation layer is made of
copper, aluminum or an alloy.

6. A semiconductor package as defined in claim 2
or 3, wherein said heat radiation layer also acts as a
support.

35 7. A semiconductor package as defined in claim 1
or 2, wherein said insulating layer comprises a polyimide
resin or an epoxy resin.

8. A semiconductor package as defined in claim 1 or 2, wherein said semiconductor device positioned as the uppermost layer further comprises a resin sealing layer on the device pattern surface thereof, and said resin sealing layer is one formed on the device pattern surface of the wafer as the uppermost layer, before said semiconductor package is diced.

9. A semiconductor package as defined in claim 1 or 2, wherein the device patterns of said semiconductor devices stacked are electrically connected to one another through a re-wiring layer and a substrate through-electrode that are simultaneously formed in one semiconductor device.

10. A semiconductor package as defined in claim 9, wherein each of said re-wiring layer and said substrate through-electrode is formed of copper or its alloy.

11. A method of producing a semiconductor package comprising a stacked body of two or more semiconductor devices each having a substrate and a device pattern formed on a surface thereof, comprising the steps of:

12. processing a wafer comprising a semiconductor material to collectively fabricate a plurality of semiconductor devices having a predetermined device pattern on a surface thereof in a batch process to thereby produce a semiconductor device-packaged wafer and repeating the production of the semiconductor device-packaged wafer;

13. bonding another semiconductor device-packaged wafer onto a lower semiconductor device-packaged wafer through an insulating layer with a non-device pattern surface of said another semiconductor device-packaged wafer facing downward, wherein in a step of producing said another semiconductor device-packaged wafer, a wafer comprising the semiconductor material is bonded onto the device pattern surface of said lower semiconductor device-packaged wafer, and said bonded wafer is fabricated to collectively fabricate a plurality

of semiconductor devices having a predetermined device pattern on a surface thereof; and

5 after bonding of a required number of said semiconductor device-packaged wafers necessary for completing said semiconductor package is completed, dicing the resulting wafer stacked body along a predetermined dicing line to obtain discrete semiconductor packages from said wafer stacked body.

10 12. A production method of a semiconductor package as defined in claim 11, wherein a heat radiation layer is formed from a material having a high heat transfer rate on the non-device pattern surface of said semiconductor device-packaged wafer as the lowermost layer in said wafer stacked body.

15 13. A production method of a semiconductor package as defined in claim 12, wherein said heat radiation layer is formed by a thin film formation technology.

20 14. A production method of a semiconductor package as defined in claim 12 or 13, wherein said heat radiation layer is formed of copper, aluminum or an alloy thereof.

15. A production method of a semiconductor package as defined in claim 11 or 12, wherein said insulating layer is formed of a polyimide resin or an epoxy resin.

25 16. A production method of a semiconductor package as defined in claim 11 or 12, wherein a resin sealing layer is further formed on the device pattern surface of said semiconductor device-packaged wafer as the uppermost layer in said wafer stacked body.

30 17. A production method of a semiconductor package as defined in claim 11 or 12, wherein a re-wiring layer and a substrate through-electrode are simultaneously formed in the step of producing said another semiconductor device-packaged wafer.

35 18. A production method of a semiconductor package as defined in claim 17, wherein said re-wiring layer and said substrate through-electrode are formed of copper or an alloy thereof.